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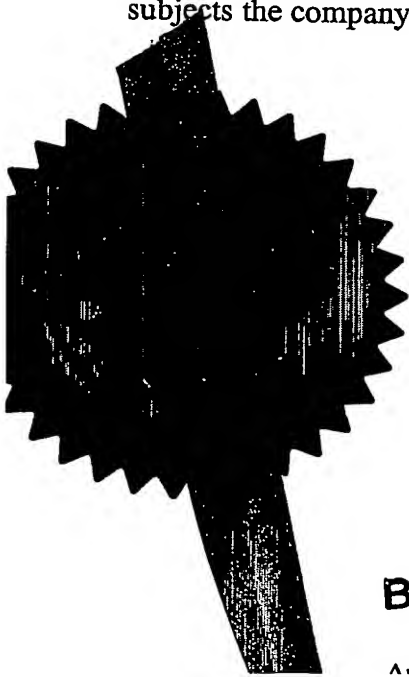


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*L. Mahoney*

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1/77

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1. Your reference 29 NOV 2002 6.70.1031 UK 02DEC02 E767560-1 000073  
P01/7700 0.00-0227923.0

2. Patent application number  
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0227923.0

3. Full name, address and postcode of the or of each applicant (underline all surnames)

INTERBREW S.A.  
VARSTRAAT 94  
B-3000 LEUVEN  
BELGIUM

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

A BELGIAN CORPORATION

7906530002

4. Title of the invention

ALCOHOL DISPENSER WITH KEG COOLING

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

G.F. REDFERN & CO.  
LYNN HOUSE  
IVY ARCH ROAD  
WORTHING  
WEST SUSSEX. BN14 8BX

Patents ADP number (if you know it)

1412002

8435356001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

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Priority application number  
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Date of filing  
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

YES

- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
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Continuation sheets of this form

Description

8

Claim(s)

3

Abstract

1

Drawing(s)

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Priority documents

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Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

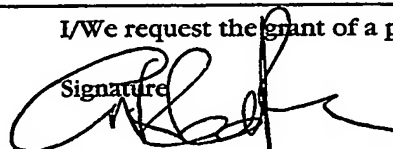
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Signature



Date

29 November 2002

12. Name and daytime telephone number of person to contact in the United Kingdom

Mrs. S.M. Camp  
01903 820466

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- 1 -

## ALCOHOL DISPENSER WITH KEG COOLING

### Field of the Invention

The present invention relates to a beer or like alcohol beverage dispensing apparatus and, in particular, relates to the effect keg material selection has on the cooling of the alcohol beverage.

### Background of the Invention

In taverns, it is typical to store draft beer in kegs and dispense the beer from a tap into a glass. The tap is connected to a source or supply of beer which is typically in the form of multiple kegs. In large establishments, it is practical to store the kegs in a refrigerated compartment. When a keg is depleted of its contents, it is possible then to tap into another keg already stored within this refrigerated environment. However, in home beer dispensing apparatus, these apparatus typically house smaller kegs containing anywhere from five to six liters of beer.

Because of the environment, it is common that the beer is not refrigerated prior to insertion into the home dispensing apparatus. This presents a problem when a user wishes to obtain a serving of beer from

the dispenser prior to the beer contained within the keg reaching a suitably cold serving temperature.

This problem associated with an initial serving prior to the beer contents of the keg being cooled to a suitable serving temperature is compounded further by different consumer preferences where consumers may wish to have an initial serving of one glass of beverage or multiple glasses such as two servings of the beverage.

There is a need to provide cooling systems that accommodates a consumer who desires to have one initial serving of beverage prior to the beer or beverage in the keg reaching it's serving temperature or, alternatively, for a consumer who desires to have multiple servings of the beverage prior to the beverage reaching it's desired serving temperature.

#### Summary of the Invention

It is a first object of the present invention to provide a beer or the like alcohol beverage dispensing system having a cooling apparatus that cools the beverage in a manner to provide an initial serving that is relatively cold compared the beverage remaining in the keg after the initial serving and prior to the beverage reaching a desired serving temperature.

It is a second object of the present invention to provide a beer or the like alcoholic beverage dispensing system having a cooling apparatus that uniformly cools the beverage so that two servings of beverage may be drawn at substantially the same temperature prior to the beverage reaching its desired serving temperature.

In accordance with the first object of the present invention there is provided a beer or like alcohol beverage dispensing apparatus comprising a keg containing beer or like alcohol beverage and having a bottom

portion. The apparatus has a keg dispensing device extending into the keg to the bottom portion to draw the beverage from the keg adjacent the bottom portion. The apparatus has a cooling apparatus in heat transfer contacting relation with the bottom portion of the keg for cooling the beverage contained in the keg through the bottom portion. The keg comprises a material selected from the group consisting of steel, stainless steel and copper that initially cools the beverage in the keg upwards from the bottom portion of the keg to produce a stratified beverage temperature effect whereby, prior to all the beverage in the keg reaching a desired serving temperature, the beverage adjacent the bottom portion of the keg is the coolest beverage available for an initial serving.

In accordance with the second object of the present invention, there is provided a beer or like alcohol beverage dispensing apparatus comprising a keg containing beer or like alcohol beverage and having a bottom portion. The dispensing apparatus has a keg dispensing device extending into the keg to the bottom portion to draw the beverage from the keg adjacent the bottom portion. The dispensing apparatus has a cooling apparatus in heat transfer contacting relation with the bottom portion of the keg for cooling the beverage contained in the keg through the bottom portion. The keg comprises an aluminum material that initially cools the beverage in the container in a substantially homogeneous manner above the bottom portion of the keg whereby two servings of beverage dispensed from the keg are at substantially the same temperature prior to the beverage reaching a desired serving temperature.

#### Brief Description of The Drawings

For a better understanding of the nature and objects of the present

invention reference may be had to the accompanying diagrammatic drawings in which:

Figure 1 is a front elevation view of a home beer dispensing apparatus in accordance with the present invention;

Figure 2 is a side elevation view of the home beer dispensing apparatus; and,

Figure 3 is a side sectional view of the keg shown inside the beer dispensing apparatus of Figure 2 having a dispensing spear within the keg and a cooling system for cooling the contents of the keg.

#### Detailed Description Of The Invention

Referring to Figures 1 and 2 there is shown a home beer dispensing apparatus, appliance or unit 10. The dispensing apparatus 10 is primarily intended for use in domestic kitchens but may also be used in utility rooms, garages, domestic bars, caravans etc. While the preferred embodiment relates to dispensing beer, alternatively carbonated solutions or other alcohol beverages may be dispensed by apparatus 10.

The home beer dispensing apparatus 10 has a front wall 12 and a dispensing tap 14 protruding forward of the front wall 12. A drip tray 16 also protrudes forward of the front wall 12 and is adapted to support an open glass container 18 below the dispensing tap 14. The home beer dispensing apparatus 10 further has a base 21 adapted to rest on a counter top in a kitchen. The front wall 12 is formed as an extension of two pivoting side walls 20 which may be moved between closed and open positions to allow the keg 22 (see Figure 2 in broken lines) to be inserted into the housing of the home beer dispensing apparatus 10. The housing of the home beer dispensing apparatus 10 further includes a top wall 24

and a rear wall 26. The rear wall 26 has a grill 30 that permits for air circulation within the home beer dispensing apparatus 10. An electrical cord 32 extends through the rear wall 26 of the apparatus 10 to provide a connection into a main electrical supply to supply electrical power to the electrical components housed within the dispensing apparatus 10. Alternatively, a 12 Volt DC supply input may be used.

The dispensing apparatus 10 has a cooling system 23 located behind and below keg 22 that is adapted to cool the keg 22 of beer when placed in dispensing apparatus 10. The dispensing apparatus 10 also dispenses the beer by providing a pressurised air supply (not shown).

Referring to Figure 3, the keg 22 of the present invention is shown in more detail. The keg 22 has a general cylindrical shape with side walls 40 and a top wall or top portion 42 and a bottom wall or bottom portion 44. Both top wall 42 and bottom wall 44 are curved upwardly from the central portion of the keg 22 and are provided at both the top and bottom portions 42, 44 with a hoop and girder 46. The hoop and girder 46 provide additional support for the keg. Mounted within the keg walls 40, 42 and 44 is a plastic bag 50 for containing alcohol beverage or in the preferred embodiment, beer 52.

As shown in Figure 3, the keg is filled completely with beer 52 within the bag 50 and as a result the bag 50 lines the inside walls of the keg 22. As the beer 52 is dispensed from the keg 22, an air pressure is established between the walls of the bag 50 and the inside surfaces of walls 40, 42 and 44 of the keg so as to provide pressure to the bag allowing the beer 52 to be dispensed from the keg 22.

The top portion 42 and hoop and girder 46 located in the top portion 42 of keg 22 has a keg dispensing device 60 extending through



the top hoop and girder 46. The keg dispensing device 60 is connected to the tap 14 of the beer dispensing apparatus 10 by a tube connection (not shown) extending from the keg dispensing device 60 at it's top end 62. The dispensing device 60 is shown to extend into the keg 22 within bag 50 so as to provide a remote opened end 64 adjacent the bottom portion 44 of the keg for drawing beer 52 from the keg adjacent the bottom portion 44 of the keg 22. The dispensing device 60 comprises a hollow spear 66 that extends between it's one end 62 and it's open end 64 so as to permit beer to be drawn therethrough and out through the tap 14 (Figure 1).

The cooling of the keg 22 within the beer dispensing apparatus 10 is accomplished by a cooling plate 70 having a cooling surface 72 that is in mechanical and heat transfer contacting relation with the bottom portion of the keg 22.

The cooling apparatus further includes a Peltier thermoelectric device 80 mounted in mechanical and thermal heat transfer contacting relation with the cooling plate 70. The Peltier thermoelectric device 80 is connected through a suitable leads and transformer (not shown) to the power supply line or cord 32 (see Figure 2) so that a voltage is applied across the Peltier thermoelectric device 80. The voltage drop across this Peltier cooling device 80 results in a thermal difference being generated across the device whereby surface 82 of Peltier device 80 is cooler than hot surface 84. As a consequence, heat is extracted from the cooling plate 70 which inturn extracts heat from the keg 22. The Peltier thermoelectric device 80 provides a low rate of continuous cooling.

In accordance with the present invention, the material selection for the keg 22 in conjunction with the cooling apparatus 23 comprising

cooling plate 70 and Peltier thermoelectric device 80 may be chosen to provide the consumer with an initial serving of the beverage or beer 52 at it's coldest temperature possible prior to the contents or the entire beverage beer 52 reaching a desired serving temperature.

For this aspect, the keg 22 is selected from either steel or stainless steel material to provide a stratified cooling of the beer 52 within the keg 22. This stratified cooling is shown by horizontal lines 90, 92 and 94 representing cooler temperatures of the beer 52 within the keg 22 as the distance of the beer 52 from the bottom portion 44 of the keg increases. This is due in part to the location of the cooling plate being at the bottom portion 44 of the keg 22 and in part to the heat transfer relation of the steel or stainless steel from the bottom wall portion 44 up the side walls 40. In other words, when steel or stainless steel is used for keg 22, heat extracted from the beer occurs through the keg bottom portion 42 at a faster rate than heat extracted from the beer 52 through the side walls 40 of keg 22. This produces a stratification effect in temperature and results in an initial beverage serving from the tap 14 drawing on beer 52 that is adjacent the bottom portion 44 of the keg 22 being the coldest beer available. It should be understood however that a second serving immediately following the first serving will probably not be as cold as the first serving until such time as the temperature of the beer 52 within keg 22 has reached it's desired serving temperature.

In accordance with another aspect of the present invention the keg may comprise aluminum mounted with the cooling plates 70 and the Peltier thermoelectric device 80 for the cooling apparatus. In this embodiment, the beer 52 will be cooled in a more even or homogeneous manner such that the stratification effect shown by lines 90, 92 and 94 is

non-existent. As a result, the temperature of the beer 52 in the keg 22 will be lowered substantially homogeneously to the desired serving temperature. This homogenous cooling is believed to be the result of the aluminum being able to extract heat from side walls 40 of keg 22 at a rate to create turbulence or mixing of the beer in the keg 22. Consequently, multiple servings of beer 52 may be made through tap 14 which will be at a more uniform temperature prior to the beer 52 reaching it's desired serving temperature.

In an alternate construction, the cooling plate 70 may be provided with flange or annular flange 100 which extends partially up the side walls 40 of the keg 22 so as to insure for a more homogenous cooling rate of the beer 52 within the aluminum keg 22.

It should also be noted that the home beer dispensing apparatus 10 may have insulation provided in it's front wall 12, side walls 20, rear wall 26 and top wall 24. The insulation is provided to insulate the keg 22 from the surrounding environment of the apparatus 10 so that the beer 52 is maintained at a cooler temperature while conserving on the energy used to operate on the Peltier device 80. It is also envisaged that the insulation in the side walls and top walls of the apparatus 10 may be graduated. That is the insulation may be thicker or more effective towards the bottom portion 44 of the keg 22 and considerable less effective towards the upper portion 42 of the keg 22. This enhances the stratification effect of the keg 22.

It is further envisaged that the material used for the stratification effect may include copper, however, the cost of the copper may make it's use somewhat prohibited in this application.

WHAT IS CLAIMED IS:

1. A beer or like alcohol beverage dispensing apparatus comprising:

a keg containing beer or like alcohol beverage and having a bottom portion;

a keg dispensing device extending into the keg to the bottom portion to draw the beverage from the keg adjacent the bottom portion;

a cooling apparatus in heat transfer contacting relation with the bottom portion of the keg for cooling the beverage contained in the keg through the bottom portion,

wherein the keg comprises a material selected from the group consisting of steel, stainless steel and copper that initially cools the beverage in the keg upwards from the bottom portion of the keg to produce a stratified beverage temperature effect whereby, prior to all the beverage in the keg reaching a desired serving temperature, the beverage adjacent the bottom portion of the keg is the coolest beverage available for an initial beverage serving.

2. The apparatus of claim 1 wherein the keg has a top portion through which the keg dispensing device extends into the keg.

3. The apparatus of claim 2 wherein the keg dispensing device comprises a hollow spear having a remote open end adjacent the bottom portion of the keg for drawing the beverage therethrough and out of the keg.

4. The apparatus of claim 1 wherein the cooling apparatus comprises a cooling plate in heat transfer relation with the bottom portion of the keg for extracting heat therefrom and a Peltier thermoelectric device in heat transfer relation with the cooling plate for extracting heat

from the cooling plate.

5. The apparatus of claim 1 further comprising insulated walls surrounding the keg.

6. The apparatus of claim 5 wherein the insulated walls have graduated insulation with greater insulation capability adjacent the bottom portion of the keg and lessening insulation capability adjacent a top portion of the keg.

7. The apparatus of claim 1 wherein the beverage is contained in a bag housed within the keg, and the keg dispensing device is connected to the bag and extends into the bag.

8. A beer or like alcohol beverage dispensing apparatus comprising:

a keg containing beer or like alcohol beverage and having a bottom portion;

a keg dispensing device extending into the keg to the bottom portion to draw the beverage from the keg adjacent the bottom portion;

a cooling apparatus in heat transfer contacting relation with the bottom portion of the keg for cooling the beverage contained in the keg through the bottom portion,

wherein the keg comprises an aluminum material that initially cools the beverage in the container in substantially homogeneous manner above the bottom portion of the keg whereby two servings of beverage dispensed from the keg are at substantially the same temperature prior to the beverage reaching a desired serving temperature.

9. The apparatus of claim 8 wherein the keg has a top portion through which the keg dispensing device extends into the keg.

10. The apparatus of claim 9 wherein the keg dispensing device

comprises a hollow spear having a remote open end adjacent the bottom portion of the keg for drawing the beverage therethrough and out of the keg.

11. The apparatus of claim 8 wherein the cooling apparatus comprises a cooling plate in heat transfer relation with the bottom portion of the keg for extracting heat therefrom and a Peltier thermoelectric device in heat transfer relation with the cooling plate for extracting heat from the cooling plate.

12. The apparatus of claim 8 further comprising insulated walls surrounding the keg.

13. The apparatus of claim 8 wherein the beverage is contained in a bag housed within the keg and the keg dispensing device is connected to the bag and extends into the bag.

14. The apparatus of claim 8 wherein the keg has side walls extending up from the bottom portion and the cooling apparatus is adapted to extend up at least a portion of these side walls in heat exchange relation therewith.

## ALCOHOL DISPENSER WITH KEG COOLING

## ABSTRACT

A beer or like alcohol beverage dispensing apparatus has a keg for containing the beverage. The keg has a bottom portion and a top portion. A keg dispensing device is connected through the top portion of the keg and extends to the bottom portion of the keg to draw the beverage from the keg adjacent the bottom portion. The apparatus has a cooling plate in heat transfer contacting relation with the bottom of the keg and also has a Peltier thermoelectric device connected to the cooling plate so as to extract heat from the cooling plate and thereby extract heat from the keg. The keg may comprise either steel, stainless steel or copper so as to provide a stratified cooling effect whereby prior to all the beverage in the keg reaching a desired serving temperature, the beverage adjacent the bottom portion of the keg is the coldest beverage available for an initial serving. Alternatively, the keg may comprise aluminum so as to initially cool the beverage in the container in a more homogeneous manner whereby two or multiple servings of the beverage may be dispensed at substantially the same temperature from the keg prior to the beverage reaching a desired serving temperature.

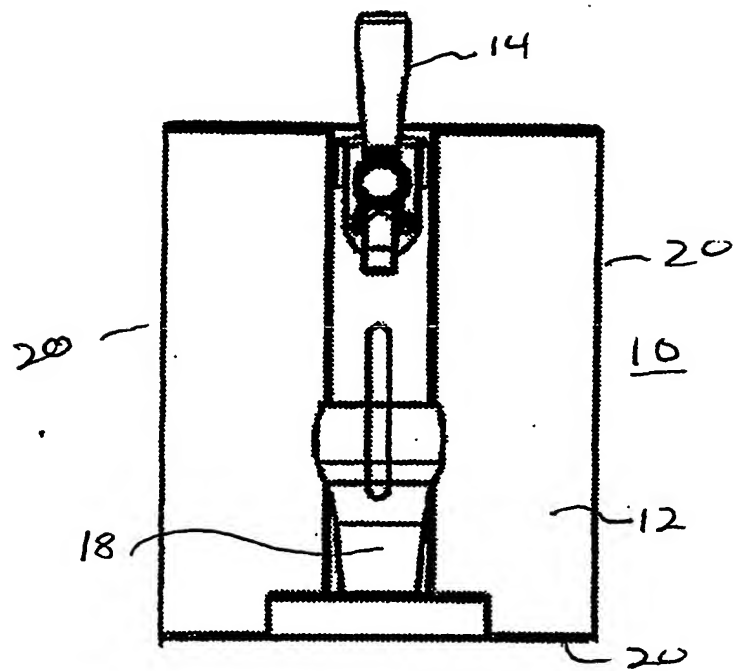


FIG. 1

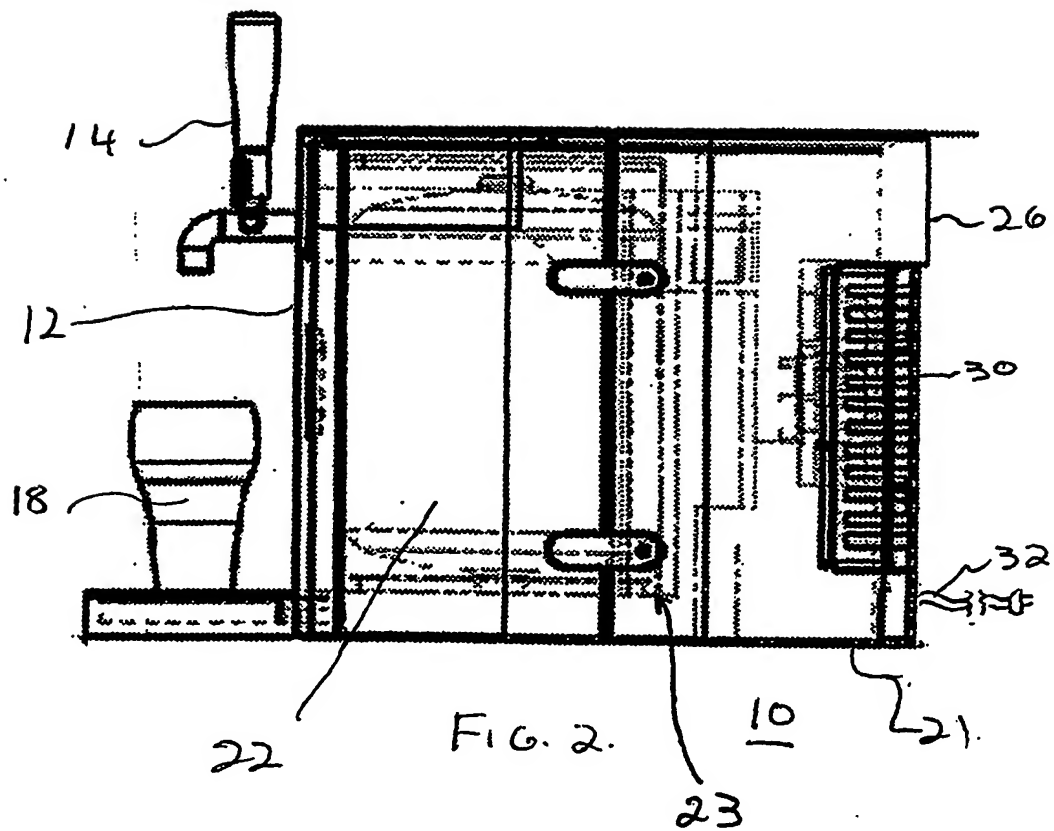
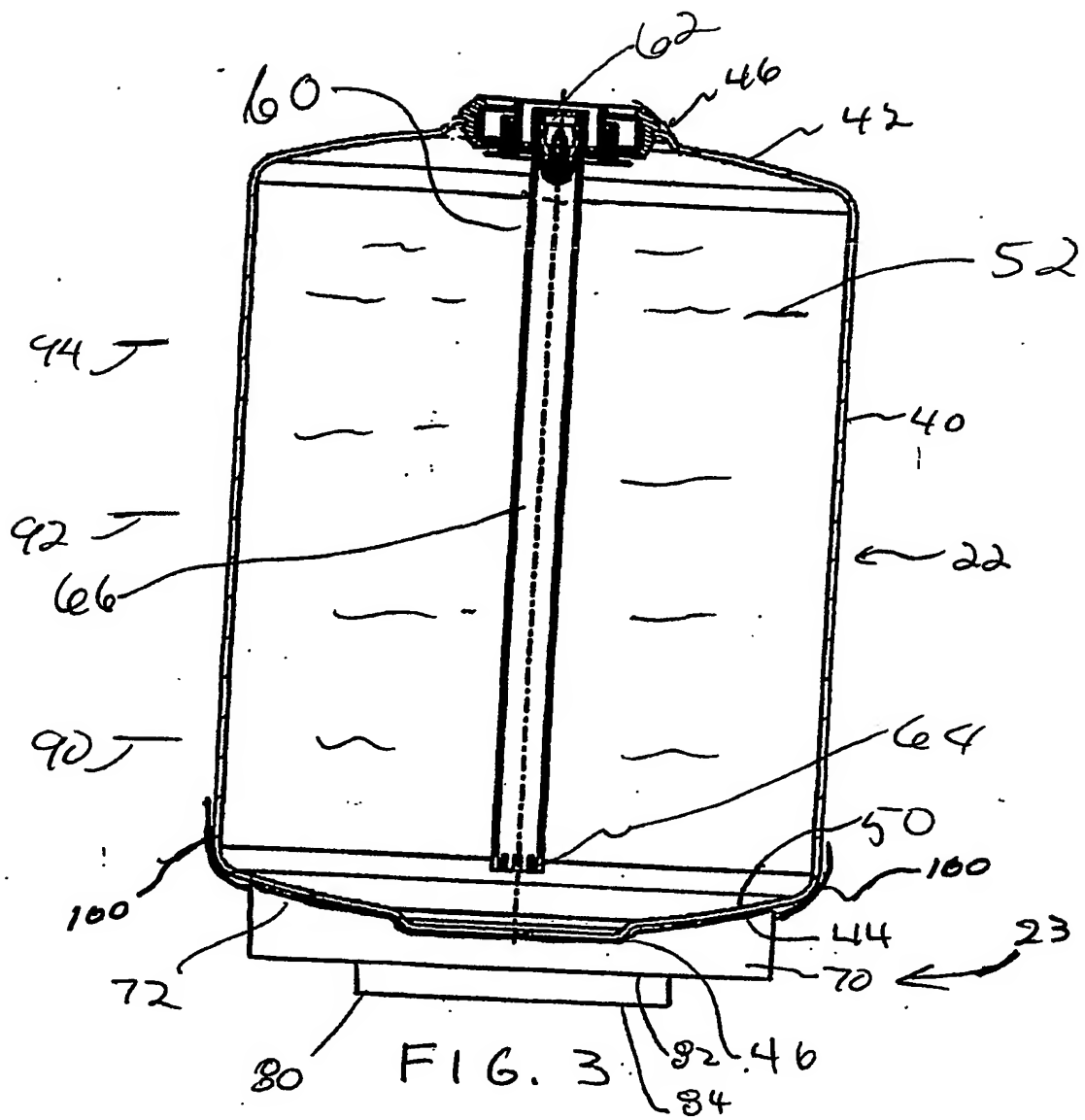


FIG. 2.





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